### Rev. T. Hincks's Catalogue of Zoophytes.

Alveolina meandrina (n. sp.), and therefore A. elliptica, are developed upon the same principle as Nummulites elongated vertically. The former has an interseptal system and marginal plexus of canals; and the latter too, probably. In Alveolina elliptica the greater part of the test is often without chambers, so that its development is as often wholly carried on by the sarcode of the canal-system; and the same is frequently the case with the last turns of the globose forms of Nummulites, e. g. N. perforata, &c.; while in Alveolina elliptica also, the chambers sometimes disappear and reappear at intervals, leaving the spire to go round by itself between them, as exemplified also in the annular canals of Orbitolites Mantelli and Orbitoides dispansa. These are the instances to which I have before alluded as evidencing a development of the chambers upon the sarcodal filaments of the canals.

The new genus for which the term "Conulites" above-mentioned is proposed has the following generic characters :----

"Conical, compressed, discoidal; consisting externally of a spiral layer of rhomboidal chambers extending from the apex to the circumference; filled up internally with convex layers of compressed columnar chambers interspersed with white columns of condensed shell-substance; white columns opake, conical, their sharp ends resting on the inner aspect of the spiral layer, and their large ones terminating at the base of the cone, which presents a slightly convex granular surface."

XXVIII.—A Catalogue of the Zoophytes of South Devon and South Cornwall. By the Rev. THOMAS HINCKS, B.A.

[Continued from p. 161.]

[Plates VII. & VIII.]

Order SERTULARIDÆ, Huxley. Fam. Sertulariadæ, Johnst.

1. HALECIUM, Oken.

1. H. halecinum, Linn.

Very common; abundant and of great size amongst the trawl-refuse.

2. H. Beanii, Johnston.

Very common; dredged abundantly all along the coast. Very fine in Salcombe Bay and Torbay. I have a specimen which stands 5 inches high, while the spread of the branches measures 6 inches.

[Lamlash, Arran; Filey, Yorkshire; Llandudno, N. W.; Ramsay, Isle of Man.]

## 3. H. tenellum, n. sp. Plate VI. figs. 1-4.

Polypary of extreme delicacy; stem simple or very slightly branched, smooth, zigzag, bearing a cell at every bend, running out at the extremity into long tendril-like fibres, which give off a few short ramuli; cells gracefully everted at the margin, often of considerable length,—in most cases a number (frequently four or five) rising one from within another, and marking the successive generations of polypes. Gonothecæ sometimes broadly ovate, sometimes elongate and pointed, borne on short pedicles and occurring singly. Height of fine specimens about  $\frac{1}{4}$  of an inch.

Abundant on Salicornaria farciminoïdes, Salcombe Bay.

This very beautiful species is remarkable for its extreme tenuity and delicacy. The character of the stem is peculiar : it is made up of a number of straight portions, each terminating in a cell, which spring one from the other at the base of the cells, and bend alternately to opposite sides. There is a slight crenation of the stem just above each cell. A simple cell is rarely met with on mature specimens. Generally the polype protrudes from the uppermost of a pile of little cups with prettily everted rims, which fit one into the other and form a branchlet of some length.

The gonothecæ are of two forms, one somewhat broadly ovate, the other slender and tapering. The former contains a large sporosac, in which a single (?) ovum is produced. The latter is probably the male capsule\*.

## 2. SERTULARIA, Linn.

## 1. S. polyzonias, Linn.

Very common: on rocks near low-water mark; dredged, on other zoophytes, Ascidiæ, stones, &c., in 15-20 fathoms; amongst the trawl-refuse. It presents many varieties of size and habit. When living, it is of a bright straw-colour, and is certainly one of the prettiest, as it is one of the commonest and most widelydistributed, of the Sertularian Hydrozoa.

2. S. Gayi, Lamouroux, Expos. Méth. 12. pl. 66. figs. 8, 9.

Not uncommon in the Coralline zone: amongst the refuse of the Plymouth trawlers, fine; on *Pinna* from a depth of 60 fa-

\* I have already pointed out that the male and female capsules are of different form in *H. halecinum* and *H. Beanii* (Rep. of Brit. Assoc. for 1858). In the latter species the sperm-capsules are elongate-ovoidal, the calceoliform capsules producing the ova. In *H. halecinum* the male gonothecae are simply ovate, wanting the tubular process at the top which distinguishes the female. The same difference seems to exist in the present species.

### of South Devon and South Cornwall.

thoms off the Deadman. One specimen in my possession is more than 4 inches high, and measures not less than 6 inches across. The main stem is of great thickness, and the whole bears a striking resemblance to an aged tree.

The S. Gayi of Lamouroux is the S. polyzonias, var.  $\beta$ , of Johnston ("caulescent, pinnate"). Its very distinct habit, compound stem, and pinnate branching seem to entitle it to specific rank.

3. S. tenella, Alder, Northumb. & Durham Cat. pl. 2. figs. 3-6.

Between tide-marks; probably not uncommon.

[Filey, Yorkshire.]

# 4. S. fusiformis, n. sp. Plate VI. figs. 7, 8.

Minute; stem slender, slightly zigzag, generally unbranched, annulated at the base and below each cell; cells alternate, bent in opposite directions, elongate, somewhat flask-shaped, smooth,—aperture quadridentate, with an operculum composed of four pieces; each cell and its internode of a fusiform figure. Gonothecæ elongate, slender, tapering above and below, ribbed across, produced at the upper extremity into a short neck and toothed, springing here and there just below a cell. Height about a quarter of an inch.

Between tide-marks.

This species presents the appearance of a single series of fusiform pieces, springing one from the side of the other about midway, and bending alternately in opposite directions. Its nearest ally is the *S. tenella* of Alder, from which it differs in the shape of the cells and capsules.

It was first detected by Mr. Alder, who noticed it amongst some Devon zoophytes which I had sent him for examination.

## 5. S. rugosa, Linn.

Generally on *Flustra foliacea*; not so common as in the North.

### 6. S. pumila, Linn.

Universally distributed, on weed and rock between tide-marks.

### 7. S. gracilis, Hassall.

Torbay, between tide-marks.

Nearly allied to the preceding, from which, however, it differs in the minute characters. It is also of much slenderer habit.

## 8. S. rosacea, Linn.

Very common; parasitical on other zoophytes.

### 9. S. Margareta, Hassall.

Devonshire (Mrs. Griffiths).

I have never obtained this species myself. It must be rare, or it would have turned up amongst the large quantities of trawl-refuse which I have examined from time to time. Are not S. pinaster and S. Margareta different sexes of one and the same species ?

In the case of S. tamarisca, the researches of Prof. Allman have shown that the male and female capsules are dissimilar\*.

## 10. S. nigra, Pallas.

Not uncommon at certain points off the Devon and Cornish coasts, in deep water. From Mr. Laughrin of Polperro I have received many fine specimens (one from 40 fathoms, ten or twelve miles from shore) either of this or the next species. In the absence of the reproductive capsules, I confess myself quite unable to distinguish the one from the other, and strongly suspect that here, again, the difference in the form of the gonothecæ merely denotes a difference of sex. This point can only be settled by an examination of living specimens; and meanwhile the two names must be retained.

Off the Deadman, rare; a few miles west and north-west of the Eddystone, common (R. Q. Couch).

## 11. S. pinnata, Pallas.

I have specimens of the form with spinous capsules, from Torbay or the neighbouring sea.

Dr. Johnston received a Devonshire example from Mrs. Griffiths.

#### 12. S. tamarisca, Linn.

Common in the Coralline zone : abundant amongst the Brixham trawl-refuse ; dredged on stone, Torbay.

### 13. S. abietina, Linn.

Deep water, very common. This species is taken up in immense quantity by the trawlers.

## 14. S. operculata, Linn.

Common, investing the stems of *Laminaria*; Brixham trawlboats occasionally.

15. S. argentea, Ellis & Solander.

Very abundant, Coralline zone : one of the principal elements of the trawl-refuse; sometimes in large clusters on mussel-

\* Vide paper on the "Reproduction of S. tamarisca," in the Report of British Assoc. for 1858.

254

## of South Devon and South Cornwall.

shells. At Exmouth it occurs on the sides of rocks near lowwater-mark, but of small size, simply pinnate and plumose. In such situations it does not seem to attain its full growth; at least I do not recollect to have met with any perfectly-developed specimens between tide-marks.

#### 16. S. cupressina, Linn.

Not very common : Brixham trawl-boats; dredged in Salcombe Bay, rare.

[Filey, Yorkshire; extremely abundant and of great size.]

Dr. Johnston speaks of this species, on the authority of Mr. Peach, as "plentiful in Devon." I certainly have not found it so. Amongst the produce of the trawl it occurs but sparingly as compared with its congeners *argentea* and *abietina*.

## 3. THUIARIA, Fleming.

#### 1. T. thuia, Linn.

Devon (Turton & Kingston).

This species is included in the 'Natural History of Torquay, Dawlish, and Teignmouth,' by the above authors. I have never seen a Devonshire specimen, and Mr. Couch speaks of it as "very rare" on the coast of Cornwall. I presume therefore that it must be of very uncommon occurrence in the west, as its peculiar form would readily attract attention.

[Exceedingly abundant on the coast of Yorkshire. It is a prevalent northern form, and ranges to the North Cape.]

## 2. T. articulata, Pallas.

Not uncommon : Torbay, Exmouth, on Pinna from 60 fathoms off the Deadman.

[Filey, Yorkshire.]

### 4. ANTENNULARIA, Lamarck.

1. A. antennina, Linn.

Very common, Coralline zone.

2. A. ramosa, Lamx. Common : off the Deadman, in 60 fathoms, &c.

5. PLUMULARIA, Lamarck.

1. P. falcata, Linn.

Very abundant in the Coralline zone.

2. P. cristata, Lamk.

Very common on rocks between tide-marks, of small size;

Laminarian zone, especially on *Halidrys siliquosa*, large masses of which are often thickly covered with its graceful plumes. It occurs in great profusion and beauty under the rocky shores of Salcombe Bay, and of Berry Head, Torbay. The plumes sometimes attain a great size. On specimens procured at Exmouth they are  $2\frac{1}{2}$  inches in height, and bear about a dozen of the pod-like cases (*corbulæ* of Allman), which protect the reproductive capsules, set along the rachis. In other examples the plumes are of great width (three-quarters of an inch across), beautifully curved, and also bearing the corbulæ in a single line upon the main stem.

The tall, slender and branched variety, figured by Dr. Johnston (pl. 24. fig. 1), occurs on the South-Devon coast.

## 3. P. tubulifera, n. sp. Pl. VII. figs. 1, 2.

Plumose, simple, pinnæ alternate. Cells cup-shaped, slender, elongate, not expanded above; margin minutely denticulate; a large ear-like process on each side, springing from the rachis on a level with the rim, and a projecting process in front, supporting a small cup-like cell, with a crescentic opening at the extremity.

On Gorgonia verrucosa, from deep water, coast of Cornwall.

The plumes of this species are of a delicate habit, and about an inch, or a little more, in height; they bear a strong general resemblance to those of P. cristata, from which, however, they are readily distinguished on examination. The cells of P. tubulifera are slender, somewhat elongate, gracefully incurved in front, and are not expanded above like these of P. cristata, which are shorter and have a very patulous opening. The marginal denticulation is delicate, and very much finer than in the latter species, in which the rim is cut into very large and prominent spines, which are somewhat everted. The lateral processes, which in *P. cristata* are very slightly developed and inconspicuous, constitute a striking feature in the present species, and give a very peculiar appearance to the pinnæ when viewed in front; and instead of the short and stout spine which in P. cristata projects in front of the cell, we have in P. tubulifera an anterior process which supports a cup-like body with a crescentic orifice at the top.

There are also differences between the two species in the structure of the main stems, the joints of which are dissimilar.

The variety of *P. cristata* mentioned by Dr. Johnston as "imitating the habit of *P. pennatula*," and which is also noticed by Mr. Couch, is probably identical with this species; but the figure of it in the 'British Zoophytes' (p. 94, fig. 16) does not give any true idea of *P. tubulifera*.

256

## 4. P. pennatula, Ellis & Solander.

Very rare : first recorded as a Devon species by Montagu, in a letter to Dr. Fleming, in 1808.

A single plume, given to me by a friend, which was obtained at Teignmouth, is the only Devonshire example which I have seen. It is a peculiar variety, measuring about three-quarters of an inch across, and much less delicate and feather-like than the ordinary form.

Cornwall, from the Corwich Crab and the stems of Laminaria digitata (C. W. Peach).

## 5. P. myriophyllum, Linn.

Not common: occasionally amongst the trawl-refuse; Plymouth Sound (*Bellamy*).

### 6. P. pinnata, Linn.

Common : dredged in moderate depths ; trawled off Budleigh-Salterton, of large size, &c.

## 7. P. setacea, Ellis.

Very common between tide-marks, and dredged in moderate depths. The large, branched variety, several inches high, is obtained on the coast of Cornwall.

### 8. P. echinulata, Lamk. Pl. VII. figs. 5, 6.

Very abundant in tide-pools and the Laminarian zone; showing a predilection for Zostera marina and Chorda filum.

## 9. P. similis, n. sp. Pl. VII. figs. 3, 4.

Plumose, pinnæ alternate, one to each internode, internodes long. Cells large, curving outwards towards the top, entire, separated by two joints; a single tubule a little below each cell. Gonothecæ elongate, smooth, many-lobed.

Abundant : on weed in the Laminarian zone.

[Isle of Man.]

This species is most nearly allied to the *P. echinulata* of Lamarck, from which, however, it differs in size and general habit as well as in the minute characters.

The plumes attain a height of about an inch and a half, and are of much laxer habit and less graceful than those of *P. echinulata*. Each of the internodes into which the stem is divided bears a pinna, which originates a little below the joint. The internodes are long, about half as long again as those of *P. echinulata*. The joints of the two species present a very different appearance (Pl. VII. figs. 3, 6). In *P. similis* the internodes are of about equal width throughout; in *P. echinulata* they are *Ann. & Mag. N. Hist.* Scr. 3. Vol. viii. 17 somewhat attenuated below. The pinnæ have two joints just above the junction with the stem, the upper one of which is oblique; and two are always present between the cells. In echinulata there is (normally) only one, so that the cells are comparatively crowded.

The cells of *P. similis* are large, curving gracefully outwards towards the rim, with a wide circular opening, and present a decided contrast to the small basin-shaped cell of the allied species. Below each cell there is a single tubule, as in *P. echinulata*, but of larger size. In the latter species there is an additional tubule behind and above the cell. The gonothecæ are elongate, tapering towards the base, smooth, and divided into six or seven lobes; they are produced in great numbers both on the creeping fibre and on the stems. Several sporosacs are, I believe, present in each capsule.

In size *P. similis* much exceeds its congener, but is inferior to it in delicacy and grace.

## 10. P. Catharina, Johnston.

On Pinna from 60 fathoms, Cornwall.

[Mr. Barlee has supplied me with very fine specimens dredged off the Arran Islands, on the west coast of Ireland, where the species seems to abound.]

## 11. P. obliqua, Saunders.

Syn. Laomedea obliqua, Johnston.

At Sidmouth, on Rhytiphlæa (Miss Cutler).

I follow Mr. Alder's suggestion (*in lit.*) in referring this species to the present genus. There can be no doubt as to its true position. The mode in which the cells are placed, the jointing of the stem, and the presence of *tubules*, constitute a group of characters which connect it with the *setacea* section of *Plumularia*.

12. P. frutescens, Ellis & Solander.

Cornwall, from deep water. [Redcar and Filey, Yorkshire.]

## Fam. Campanulariadæ, Johnst.

1. LAOMEDEA, Lamx.\*

1. L. dichotoma, Linn.

## Common: generally parasitical on other zoophytes.

\* Lamouroux's Laomedea is merely retained for the sake of convenience. There is no real generic distinction between it and Campanularia. In this view I am supported by M. Sars, who says, in his account of Laomedea gracilis, "These two genera (Laomedea and Campanularia) are hardly

258

#### 2. L. longissima, Pallas.

### Syn. L. dichotoma, var. B, Johnston's Brit. Zooph. p. 102.

Very abundant in the Coralline zone : in great masses amongst the refuse of the trawl-boats.

Mr. Alder, in his Catalogue (p. 32, pl. 3. fig. 4), has represented the cell of this species as deep and narrow, and strongly denticulated. The examination, however, of adult specimens, on which the cells had been well preserved, enables me to state with confidence that this is not the case. The cell of *L. longissima* is of moderate depth, and has a wide mouth, the margin of which is cut into *shallow and blunt crenations*. Mr. Alder's figure represents a distinct form, which he at one time believed to be the *young* of *longissima*, not having had the opportunity of examining the cells on mature specimens of this zoophyte.

There can be little doubt that Lieut. Thomas's note on *L. dichotoma* (Johnston, Brit. Zooph. p. 466) refers to the present species; and he there rightly describes the crenulations of the margin as shallow, and resembling those of Van Beneden's *Campanularia volubilis*.

## 3. L. gelatinosa, Pallas.

Exmouth; rare.

This is the most beautiful of the British Campanulariadæ, from its graceful habit of growth and extreme delicacy. Dr. Johnston speaks of it as sometimes attaining a height of 8 or 10 inches. I have a specimen from Exmouth which is about 6 inches high, and consists of an exquisite cluster of as many as ten shoots.

The cells are of the thinnest texture, and it is a matter of the greatest difficulty to distinguish the crenature of the margin. Dr. Fleming describes the rim as plain, and conjectures that Pallas may have seen the tips of the tentacles showing above the edge of the cell, and mistaken them for crenations! The Russian naturalist, however, was right.

Milne-Edwards has made a new species out of Fleming's L. gelatinosa, which he supposes to be distinct from the gelatinosa of Pallas, and has given it the name of L. Flemingii. It is very desirable that this name, which has found its way into some of our lists of British zoophytes, should be expunged from the roll of species, commemorating as it does a mere mistake.

#### 4. L. geniculata, Linn.

Very common on weed, especially on the broad fronds of *Laminaria digitata*, its chosen habitat.

separated by any essential distinctions, and the species under consideration really seems to constitute a transition-form between them" ('Middelhavet's Littoral-Fauna').

Specimens of this species are often coloured red. The colour is due to a very minute Alga, which covers the surface with a network of chain-like vegetation.

L. geniculata is a phosphorescent species, and the sudden illumination of a whole forest of it on some dark frond is a truly beautiful spectacle. If it is agitated in the dark, a bluish light runs along each stem, flashing fitfully from cell to cell.

## 5. L. flexuosa, Hincks.

Syn. L. gelatinosa, var. a, Johnston, Brit. Zooph. pl. 25. figs. 3, 4.

Extremely common: on rocks and stones between tide-marks. This species and *L. neglecta* are the prevalent littoral forms. In some of the Torbay coves almost every stone is profusely covered with *L. flexuosa*. It also clothes the sides of rocks with its miniature forests, which are left beaten down and halfdried during the recession of the tide.

In some situations the stems have a tendency to run out at the extremity into tendril-like fibres.

There has been much blundering about this well-marked species, and it is still often carelessly confounded with *L. gelatinosa* by writers on natural history. It may be known at once by its flexuose habit, its large broad cells with long pedicle and even rim, and its much-elongated truncate capsules with their numerous sporosacs.

## 6. L. Lovéni, Allman.

Syn. Sea-thread Coralline, Ellis, Corall. pl. xii. c and 38 B.

Campanularia dichotoma, Lister, Phil. Trans. 1834.

— geniculata, Lovén, Wiegmann's Archiv, 1837; Schulze, Müller's Archiv, 1851.

On Fucus, at Dartmouth and Torquay.

This species, the reproduction of which has been studied with more or less completeness by several eminent naturalists, was first defined by Prof. Allman, in one of his valuable papers on the Hydroid Zoophytes ('Annals' for August 1859). His description, however, is inaccurate in one important particular. He speaks of the hydrothecæ as having an *even rim*, whereas the margin of the tall and slender cells is cut into about ten shallow and flattish crenations. So hyaline and delicate, however, is the edge, that it requires very careful manipulation to bring them into view.

There are sometimes as many as four or five of the fixed Medusoids attached at once to the gonotheca; but commonly they are less numerous.

The Laomedea gracilis of Sars, figured in his 'Middelhavet's Littoral-Fauna' (tab. 2. fig 5), is a second species which is propagated by means of fixed extra-capsular Mcdusoids.

### 7. L. angulata, n. sp. Pl. VIII.

Stem zigzag, much angulated, the spaces between the cells very long, simple or slightly branched, often running out at the extremity into long tendril-like claspers. Cells alternate, rather deep and slender, even-rimmed, set on long ringed pedicles which spring from each bend of the stem—three or four rings above the origin of each pedicle. Gonothecæ on short ringed stalks (three or four rings), produced on the creeping fibre, irregularly ovate, terminating above in a short broad neck, which is somewhat truncate at the top, with a few obscure wrinkles, and occasionally one or two projecting points. Polype with twenty-four to twenty-six remarkably long and slender tentacles.

#### On Zostera marina, Torbay.

This species presents some striking peculiarities. The general habit is very distinctive. The main stem is strongly zigzagged, the long internodes forming a series of obtuse angles. The upper extremity commonly runs out into a tendril-like prolongation, which is often of great length, much thickened above, and strongly annulated towards the lower end: this clasper is sometimes half an inch long. The pedicles which support the cells are generally long, and taper slightly upwards; they are composed of from nine to twelve rings. Sometimes there is a smooth portion about the middle of the pedicle. The cells themselves are rather deep and slightly made, with an even margin. The gonothecæ are produced, as in Campanularia, on the creeping stem; and this is the only species of Laomedea, so far as I know, in which they are thus placed. The axillary position of the capsules has hitherto been accounted an essential character of this genus. All the specimens which I have hitherto obtained are parasitic on the Zostera. The creeping fibre runs along the leaf just within the edge, giving off stems at short intervals; and between these the milk-white capsules occur, generally in twos or threes. They spring, in my specimens, from the side of the fibre, and are therefore recumbent on the surface of the leaf. The gonothecæ contain sporosacs.

The height of *L. angulata* is from  $\frac{1}{2}$  to  $\frac{3}{4}$  of an inch. Specimens occur in which the *stem* is only about  $\frac{1}{6}$ th of an inch in height, bearing two or three cells, while the *tendril* is fully  $\frac{1}{2}$  an inch in length.

I first met with this species in the Isle of Man, where it also occurs on the Zostera.

#### EXPLANATION OF THE PLATES.

#### PLATE VII.

Figs. 1, 2. Plumularia tubulifera : portion of a plume and two cells magnified. Fig. 3. Plumularia similis: portion of a plume magnified. Fig. 4. The same: gonothece magnified.

Figs. 5, 6. Plumularia echinulata : portions of plume magnified.

#### PLATE VIII.

Figs. 1-5. Laomedea angulata, of the natural size and magnified.

#### [To be continued.]

## PROCEEDINGS OF LEARNED SOCIETIES.

#### ZOOLOGICAL SOCIETY.

## April 23, 1861.—John Gould, Esq., F.R.S., V.P., in the Chair.

## DESCRIPTION OF A NEW SPECIES OF THE FAMILY CAPRIMUL-GIDE. BY JOHN GOULD, ESQ., F.R.S., ETC.

#### CHORDEILES? PUSILLUS.

Crown of the head, back, and lesser wing-coverts dark brown, mottled with grey and rufous, produced by each feather being crossed by interrupted bars of grey on the basal three-fourths, and with rufous near the tip; the greater wing-coverts, tertiaries, and scapularies are similarly marked, but the bands are larger and more freckled, and are mingled grey and rufous, these feathers are also largely tipped with rufous; primaries very dark brown, the three outermost crossed at about two-thirds from their base with a broad band of white, which on the fourth feather assumes the form of a large oval spot; the remaining primaries are marked near their bases with buffy white; upper tail-coverts brown crossed by irregular bands of buffy grey, and encircled with rufous at the tip; two central tailfeathers the same, the lateral ones brown, crossed by bands for three parts of their length from their base, and the two on each side next the central ones with a large spot of white at the tip; on the throat a large arrow-head-shaped mark of white; feathers of the chest brown, tipped with buff, forming a band across this part of the body ; under surface crossed by numerous narrow, blackish-brown and greyish-white bars, which latter become larger and whiter as they proceed towards the vent; under tail-coverts white; tarsi naked and, with the feet, mealy-brown.

Total length  $5\frac{1}{2}$  inches; wing 5; tail  $2\frac{1}{2}$ ; tarsi  $\frac{1}{2}$ .

Hab. Supposed to be Bahia.

*Remark.*—This is by far the smallest Goatsucker I have ever seen, the size of its body not exceeding that of a common Sparrow (*Passer domesticus*). Its gape is entirely destitute of bristles. I believe I have placed it in the right genus; at the same time I may observe that the wings are more curved, and the primaries less resistant, than in the other members of the genus *Chordeiles*. It is doubtless a fully adult male.